

## Supporting Information

### **Chondroitin sulphate hydrogel with sustained release of SDF-1 $\alpha$ for extensive cartilage defect repair through induction of cell homing and promotion of chondrogenesis**

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### **The experimental details of the WB assays**

The concentration of each group of protein was measured using the BCA protein assay kit (Thermo Fisher Scientific, USA). Then, the proteins were added to isometric bromophenol blue and boiled at 95°C. Samples were separated by SDS-PAGE, transferred to PVDF membranes and blocked with 5% skimmed milk. The membranes were incubated with primary antibody overnight at 4°C. The membranes were then washed with TBST and incubated with HRP-conjugated secondary antibodies. The proteins were visualized with an enhanced chemiluminescence (ECL)-chemiluminescent kit (Thermo Fisher Scientific, USA), with the images acquired using the Scion image software.

### **The experimental details of the Immunofluorescence staining assays**

Cells were fixed and permeabilized using 4% PFA for 15 min and 0.1% Triton X-100 for 15 min, respectively. The samples were rinsed and blocked using 1% bovine serum in PBS for 2 hours and incubated with primary antibodies against SOX9 (1:1000) and COL2 (1:1000) at 4 °C overnight. Next, the samples were incubated with Anti-rabbit IgG (1:500) and Anti-mouse IgG (1:500) secondary antibodies for 2 h. Finally, the cells were stained using DAPI for 15 min, rinsed with PBS, and observed under a CLSM.

**Table S1** Primers used in this assay

Gene and primer direction	Primer sequence (5'to 3')
Rat SOX9	
Forward	CACACTACAGCCCCTCCTAC
Reverse	CCTCCTCAAGGTCGA GTGAG
Rat COL2	
Forward	GACCCCATGCAGTACATG
Reverse	GACGGTCTTGCCCCACTT
Rat ACAN	
Forward	TGGTGATGATCTGGCACGAG
Reverse	CTCCG CTTCTGTAGTCTGCG
Rat $\beta$ -actin	
Forward	TGGAATCCTGTGGCATCCATGAAAC
Reverse	TAAAACGCAGCTCAGTAACAGTCC G

Fig. S1 Representative gross photos of different samples

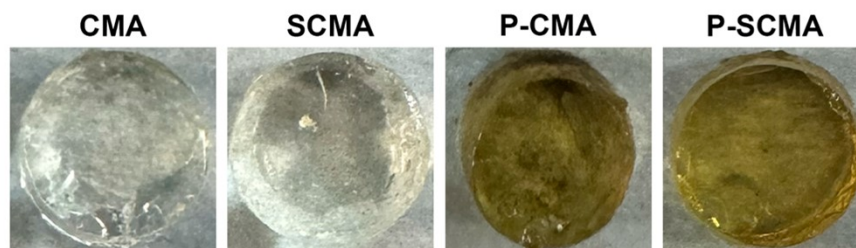


Fig.S2 Mean fluorescence intensity in single field of view based on FITC-BSA

adsorption assay

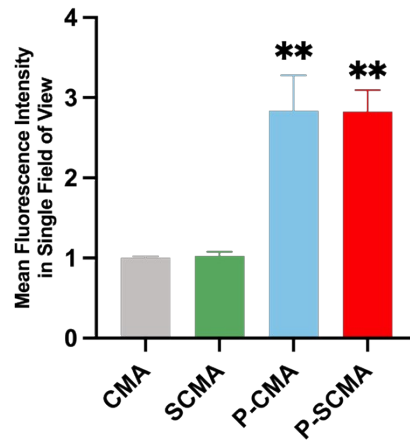


Fig.S3 Compressive strength and Elastic modulus based on Stress-strain experiment

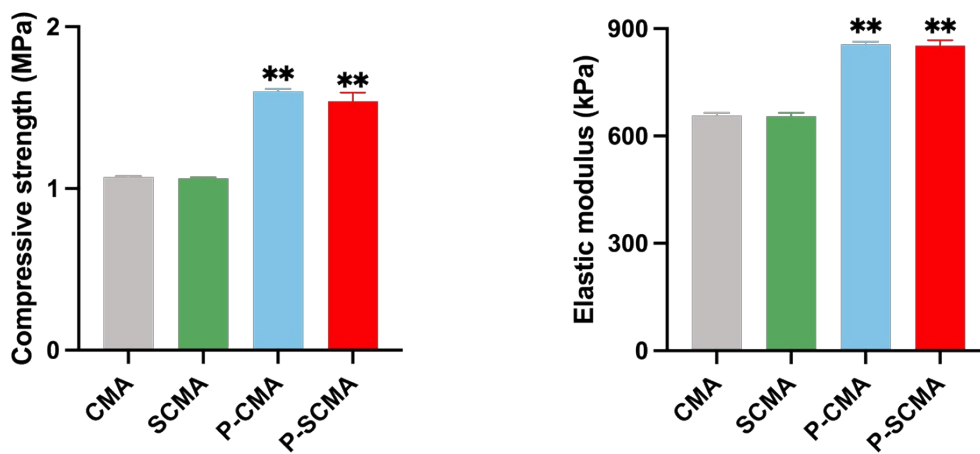


Fig.S4 Scratch distance based on wound scratch assay

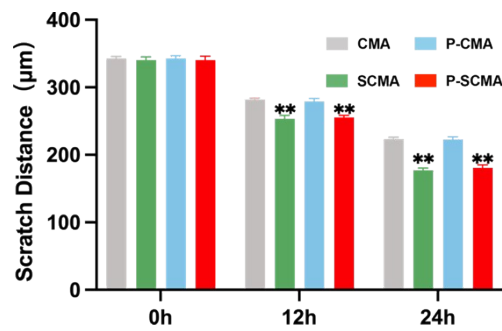


Fig. S5 Migration distance based on wound scratch assay

